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Robert A. Baade, Robert Baumann, and Victor Matheson

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Department of Economics
College of the Holy Cross
Box 45A
Worcester, Massachusetts 01610
(508) 793-3362 (phone)
(508) 793-3708 (fax)
http://www.holycross.edu/departments/economics/website

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Selling the Big Game: Estimating the Economic Impact of Mega-Events through Taxable Sales

Robert A. Baade[†]
Lake Forest College

Robert Baumann[††]
College of the Holy Cross

and

Victor A. Matheson[†††]
College of the Holy Cross
(corresponding author)

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Abstract

Professional sports leagues, franchises, and civic boosters have used the promise of an all star game or league championship as an incentive for host cities to construct new stadiums or arenas at considerable public expense. Past league-sponsored studies have estimated that Super Bowls, All-Star games and other sports mega-events increase economic activity by hundreds of millions of dollars in host cities. Our analysis fails to support these claims. Our detailed regression analysis of taxable sales in Florida over the period 1980 to 2005 reveals that, on average, mega-events ranging from the World Cup to the World Series have been associated with reductions in taxable sales in host regions of roughly $34.4 million per event.

JEL Classification Codes: L83

Keywords: sports, World Series, World Cup, Super Bowl, impact analysis, mega-event

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[†]Robert A. Baade, Department of Economics and Business, Lake Forest College, Lake Forest, IL 60045, 847-735-5136 (phone), 847-735-6193 (fax), baade@lfc.edu

[††]Robert W. Baumann, Department of Economics, Box 192A, College of the Holy Cross, Worcester, MA 01610-2395, 508-793-3879 (phone), 508-793-3708 (fax), rbaumann@holycross.edu

[†††]Victor A. Matheson, Department of Economics, Box 157A, College of the Holy Cross, Worcester, MA 01610-2395, 508-793-2649 (phone), 508-793-3708 (fax), vmatheso@holycross.edu

Introduction

Sports boosters often claim that major sporting events inject large sums of money into the cities lucky enough to host them. Promoters envision hoards of wealthy sports fans descending on a city's hotels, restaurants, and businesses, and showering them with fistfuls of dollars. For example, the National Football League (NFL) typically claims an economic impact from the Super Bowl of around $400 million (National Football League, 1999), Major League Baseball (MLB) attaches a $75 million benefit to the All-Star Game (Selig, et al, 1999) and up to $250 million for the World Series (Comptroller of New York City, 2000), and the estimated effect of the National Collegiate Athletic Association (NCAA) Men's Basketball Final Four ranges from $30 million to $110 million (Mensheha, 1998; Anderson, 2001). Multi-day events such as the Olympics or soccer's World Cup produce even larger figures. The pre-Olympics estimates for the 1996 Games in Atlanta suggested that the event would generate $5.1 billion in direct and indirect economic activity as well as 77,000 new jobs in Georgia (Humphreys and Plummer, 1995). A study of soccer's 2002 World Cup by the Dentsu Institute for Human Studies estimated a $24.8 billion impact for Japan and an $8.9 billion impact for South Korea. As a percentage national income, these figures represent 0.6% and 2.2% of the total Japanese and South Korean economies, respectively (Finer, 2002). Initial economic impact studies of the 2010 Winter Olympics in Vancouver/Whistler predict a gain to the local economy of up to $10 billion Canadian.

Of course, leagues, team owners, and event organizers have a strong incentive to provide economic impact numbers that are as large as possible in order to justify heavy public subsidies. The NFL and MLB use the Super Bowl and baseball's All-Star Game as carrots to prompt otherwise reluctant city officials and taxpayers to provide lavish funding for new stadiums to the

great financial benefit of the existing owners. For example, in baseball, of the 15 new major league stadiums built between 1970 and 1997, 13 were selected by MLB to host an All-Star Game within five years of their construction (Baade and Matheson, 2001). Similarly, during a visit to the Dallas-Fort Worth area just before a crucial vote on public funding for a new stadium, NFL Commissioner Paul Tagliabue suggested that the construction of a new stadium would lead to the opportunity for the metro area to host the Super Bowl in the next decade. Since the NFL touts economic benefits from hosting the Super Bowl of $350 to $400 million, an amount that exceeded the proposed $325 million public subsidy for the stadium, in effect, Commissioner Tagliabue was saying that combined with a Super Bowl, Arlington would be getting a new stadium for free.

With an event like the Olympics, the huge costs of hosting the event to the standards now required by the International Olympic Committee (IOC) as well as providing adequate security almost necessitate an infusion of taxpayer money. For example, while on paper the 2002 Winter Olympics in Salt Lake City made a profit, the cost figures did not include millions of dollars of additional security provided by the U.S. Department of Defense at no cost to the local organizing committee. For the 2004 Summer Games, the government in Athens spent $1.5 billion on security alone. These figures illustrate why organizers often rely on lofty reports that promise huge monetary windfalls to host cities. Since many economic impact studies are commissioned by owners, leagues, or event organizers, which stand to directly benefit from the public subsidies such reports are designed to elicit, one must question whether such studies can be believed.

Ex ante versus *ex post* studies

A typical *ex ante* economic impact study of the type used by event promoters estimates the number of visitors an event is expected to draw, the number of days each spectator is expected to stay, and the amount each visitor will spend each day. Combining these figures, an estimate of the "direct economic impact" is obtained. This direct impact is then subjected to a multiplier, usually around two, to account for the initial round of spending recirculating through the economy. This additional spending is known as "indirect economic impact." Thus, the total economic impact is roughly double the size of the initial spending. While such an estimation method is relatively straight-forward, academic economists have been quick to point out the failings of such *ex ante* studies as they often rely on poor methodology and also suffer from several theoretical problems.

First, many booster estimates are wildly optimistic about the number of potential guests and their spending habits. In March 2005, Denver tourism officials predicted 100,000 visitors for the NBA All-Star Game. Considering that the Pepsi Center, the game's venue, only holds 20,000 fans, and that Denver has only about 6,000 hotel rooms, it is not clear exactly how such an influx of basketball fans would be possible.

In many cases, the variation in estimated benefits alone is enough to question the validity of the studies. A series of studies of the NBA All-Star game produced numbers ranging from a $3 million windfall for the 1992 game in Orlando to a $35 million bonanza for the game three years earlier in Houston. (Houck, 2000) Similarly, the 1997 NCAA Women's Basketball Final Four was estimated to have an economic impact of $7 million on the local economy of Cincinnati, but the same event was predicted to produce a $32 million impact on the San Jose economy just two years later. (Knight Ridder News Service, 1999) The ten-fold disparity in the

estimated impact for the same annual event illustrates the *ad hoc* nature of these studies. In some cases, economic impact figures appear to be completely fabricated. While city or league officials may suggest a certain monetary figure from a particular event, when pressed on the details, the "missing study" syndrome arises (Anderson, 2004).

Even when *ex ante* studies are done in a carefully considered manner, they suffer from three primary theoretical deficiencies: the substitution effect, crowding out, and leakages. The substitution effect occurs when consumers spend money at a mega-event rather than on other goods and services in the local economy. A local resident who goes to an All-Star Game when it is in town is spending money at the game that likely would have been spent locally in the absence of the game. Therefore, the local consumer's spending on a sporting event is not new economic activity, rather a reshuffling of local spending. For this reason, most economists advocate that spending by local residents be excluded from any economic impact estimates.

Even including only out-of-region visitors in impact studies may still result in inflated estimates if a large portion of the non-local fans at a game are "casual visitors," that is out-of-town guests who go to a sporting event, but are visiting the host city for reasons other than the sporting event itself. For example, a college professor at an academic conference may buy a ticket to a local game, and therefore the ticket would be counted as a direct economic impact of the sports contest. The professor, however, would have come to the city and spent money on hotels and restaurants in the absence of the sporting match, and again the money spent at the game substitutes for money that would have spent elsewhere in the local economy.

Similarly, *ex ante* estimates may be biased upwards if event guests engage in "time-switching," which occurs when a traveler rearranges a planned visit to a city to coincide with a mega-event. One example of time-switching is someone who has always wanted to visit Hawaii

who plans a trip during the NFL's Pro-Bowl. While the Pro-Bowl did influence the tourist's decision about *when* to come, it did not affect the decision *whether* to come. Therefore total tourism spending in Hawaii is unchanged; the Pro- Bowl simply affects the timing of such spending.

In the case of mega-events, the amount of new spending that is new to the economy is thought to be quite large in comparison to the total amount of spending, since these "premier" events are thought to attract large audiences from outside the local economy, many of whom come specifically for the event. Whereas 5% to 20% of fans at a typical MLB game are visitors from outside the local metropolitan area, the percentage of visitors at an event like an All-Star Game or the Super Bowl is thought to be much higher (Siegfried and Zimbalist, 2000). High prices charged by hotels and other businesses in the hospitality industry also tend to dissuade casual visitors during mega-events.

A second source of bias is "crowding out," which results from the congestion caused by a mega-event that dissuades regular recreational and business visitors from coming to a city during that time. While a city's hotels may be full of sports fans during the Super Bowl, if the city's hotels are generally full of vacationers or conventioneers anyway, the Super Bowl simply displaces other economic activity that would have occurred. In other words, the economic impact of a mega-event may be large in a gross sense but the net impact may be small. Scores of examples of this phenomenon exist. As a case in point, during the 2002 World Cup in South Korea, the number of European visitors to the country was higher than normal, but this increase was offset by a similar sized decrease in the number of regular tourists and business travelers from Japan who avoided South Korea due to World Cup hassles. The total number of foreign visitors to South Korea during the World Cup in 2002 was estimated at 460,000, a figure

identical to the number of foreign visitors during the same period in the previous year. (Golovnina, 2002)

A third source of bias comes from leakages. While money may be spent in local economies during mega-events, this spending may not wind up in the pockets of local residents. The taxes used to subsidize these events, however, are paid for by local taxpayers. The economic multipliers used in *ex ante* analyses are calculated using complex input-output tables for specific industries grounded in inter-industry relationships within regions based upon an economic area's normal production patterns. During mega-events, however, the economy within a region may be anything but normal, and therefore, these same inter-industry relationships may not hold. Since there is no reason to believe that the usual economic multipliers are the same during mega-events, any economic analyses based upon these multipliers may, therefore, be highly inaccurate.

In fact, there is substantial reason to believe that during mega-events, these multipliers are highly overstated, which overestimates the true impact of these events on the local economy. Hotels, for example, routinely raise their prices during mega-events to three or four times their normal rates. The wages paid to a hotel's workers, however, remain unchanged, and indeed workers may be simply expected to work harder during times of high demand without any additional monetary compensation. As a hotel's revenue increases without a corresponding increase in costs, the return to capital (as a percentage of revenues) rises while the return to labor falls. Capital income is far less likely to stay within the area in which it is earned than labor income, and therefore, one might expect a fall in the multiplier effect during mega-events due to these increased leakages (Matheson, 2004).

While *ex ante* estimates often do a credible job in determining the economic activity that occurs as a result of a mega-event and may also address the issue of the substitution effect by

excluding spending by local residents, they generally do a poor job of accounting for crowding-out and almost never acknowledge the problems associated with the application of incorrect multipliers. For these reasons, numerous studies have looked back at the actual performance of economies that have hosted mega-events and have compared the observed economic performance of host cities to that predicted in *ex ante* studies. These *ex post* analyses generally find that *ex ante* studies routinely exaggerate the benefit of mega-events often by up to a factor of 10.

Baade and Matheson (2001) examine MLB's All-Star Game and find that employment growth in host cities between 1973 and 1997 was 0.38 percent lower than expected compared to other cities. A similar examination of the 1996 Summer Olympics in Atlanta found employment growth of between 3,500 and 42,000 jobs, a fraction of 77,000 new jobs claimed in *ex ante* studies (Baade and Matheson, 2002). An examination of metropolitan area-wide personal income during 30 NCAA Men's Final Four Basketball tournaments found that, on average, personal incomes were lower in host cities during tournament years (Baade and Matheson, 2004a). A similar study of the 1994 World Cup in the U.S. found that personal income in host cities was $4 billion lower than predicted, a direct contradiction to *ex ante* estimates of a $4 billion windfall (Baade and Matheson, 2004b). Coates and Humphreys (2002) examine the effect of post-season play in all four major U.S. sports on per capita personal incomes and find in all cases that hosting playoff games has a statistically insignificant impact on per capita incomes.

The remainder of this paper adds to the already substantial body of work regarding *ex post* analyses of sporting events by using taxable sales data to estimate the effect of mega-events on local economies.

Use of Taxable Sales

Taxable sales are ideally suited to measuring the economic impact of large sporting events for several reasons. First, there is a direct connection between sales tax collections and sporting events or facilities. Boosters often include large sums for visitor spending in their *ex ante* estimates of the economic impact of an event. In one of the few examples of a league-sponsored *ex post* study, the NFL reported that Super Bowl XXXIII in 1999 was responsible for a $670 million increase in taxable sales in South Florida compared to the equivalent January-February period in 1998 (NFL Report, 1999). Numerous publicly funded sports facilities have also been financed specifically from sales tax collections or through specific increases in the sales tax rate making an examination of taxable sales especially relevant. For example, of the 22 new stadiums constructed for NFL franchises between 1992 and 2005, 6 were funded, at least in part, through increases in the local general sales tax rate while another 8 were funded through increased excise taxes, i.e. sales taxes on specific goods and services such as rental cars or hotel rooms (Baade and Matheson, 2006). In addition, consumer spending, much of which is captured by taxable sales, is the single largest component of gross domestic product and therefore is a good proxy for economic activity.

A second major reason that taxable sales are a useful tool in measuring the economic impact of mega-events is that even significant economic events may be hard to isolate within the large, diverse metropolitan economies in which they take place. For example, even if the Super Bowl does result in a $400 million boost to the host city, this is less than 0.1% of the annual personal income of a metropolitan area like Los Angeles, a frequent Super Bowl host. Any income gains as a result of the game would likely be obscured by normal fluctuations in the region's economy. If the event can be isolated within space and time, however, any potential

impact is more likely to be identified. For example, while the presence of a World Series might have a large effect on neighborhood businesses, the overall effect on a state or country's economy will be minuscule and hard to identify. Furthermore, these same economic effects may be large for the time period immediately surrounding the event, but over the course of an entire year, the impact during a perhaps week-long period is not likely to show up as an important change.

Most previous studies of mega-events have used personal income (Baade and Matheson, 2004a, 2004b), per capita income (Coates and Humphreys, 2002), or employment data (Baade and Matheson, 2001; 2002) to estimate the *ex post* economic impact of sports. These data are generally available only annually and at the county or metropolitan area level, and therefore these studies suffer from the limitations mentioned previously. Taxable sales data, on the other hand, are often published either monthly or quarterly and can cover areas down to the city level or smaller. Therefore, these data can be analyzed to identify activities that are much smaller in scale and duration.

Several previous attempts to measure the effect of mega-events through taxable sales data have been made. Baade and Matheson (2000) challenge the NFL's claim of a $670 million boost in South Florida's taxable sales and arrive at a figure of a mere $37 million boost. Their analysis is quite simplistic, however, accounting for only GDP growth, inflation, and population growth in their estimates. Baade and Matheson (2001) examined taxable sales in California to determine the effect of MLB's All-Star Game on local economies. They found that the three California cities that hosted All-Star Games between 1985 and 1997 suffered an average drop in taxable sales of roughly $30 million in the quarter in which the game took place. Their study, however, is limited only to baseball's All-Star Game.

Porter (1999) provides the most detailed analysis of taxable sales with respect to mega-events, using regression analysis to determine that the economic impact of the Super Bowl was statistically insignificant, that is not measurably different from zero. After reviewing short-term data on sales receipts for several Super Bowls, Porter concluded:

> Investigator bias, data measurement error, changing production relationships, diminishing returns to both scale and variable inputs, and capacity constraints anywhere along the chain of sales relations lead to lower multipliers. Crowding out and price increases by input suppliers in response to higher levels of demand and the tendency of suppliers to lower prices to stimulate sales when demand is weak lead to overestimates of net new sales due to the event. These characteristics alone would suggest that the estimated impact of the mega-sporting event will be lower than the impact analysis predicts.

This paper expands the scope of previous work in the area of taxable sales by including a much broader array of mega-events, a larger number of host cities, and a more detailed regression analysis in its examination

The Data

The data used in this paper include just over 25 years of monthly sales tax data from January 1980 through June 2005 for every county in Florida. Florida is an ideal candidate for analysis since its cities have hosted championship events for each of the "Big Four" American professional sports – football, baseball, basketball, and hockey – as well as soccer's World Cup. In addition, Florida cities have also hosted all-star games in professional basketball, hockey, and soccer.

In order to maximize the chance that the economic effects of the events can be isolated, i.e., to minimize statistical "noise," it is crucial to find data as specific to the area in which the mega-events occurred and as high-frequency as possible. Florida provides monthly data on taxable sales for individual counties, and these data meet our criteria. In the analysis, taxable sales from several counties are added together corresponding to the four specific Florida metropolitan statistical areas (MSAs) that will be examined: Miami-Fort Lauderdale-West Palm Beach, Tampa-St. Petersburg, Orlando, and Jacksonville.

Since the current gross domestic products of large MSAs in Florida such as Miami or Tampa exceed $50 billion in nominal terms, even the effects of a potential major economic event such as the Super Bowl can be obscured by the normal economic fluctuations of this large, diverse economy. Many factors including the local, regional and national business cycle, state and federal government policies, monetary policy and inflation, international factors, consumer and business confidence, wealth effects, and a host of other ingredients tend to influence taxable sales. In order to prevent these other factors from clouding the true effects of the event being studies, it is essential to find a method to account for them.

One method for filtering much of the "noise" is to analyze the change in taxable sales in the MSA in which an event takes place as a percent of the taxable sales in the rest of the state of Florida. Since it is reasonable to assume that many of these exogenous factors will affect the economies of the individual counties and the state in a similar way, this method serves to account for the economic impact of all the variables that the county and state have in common. The MSA/state ratio, therefore, is influenced only by economic events that are unique to one area or the other. While some economic activity related to a mega-event may occur in areas peripheral to the MSA in which the event takes places, the vast majority of the economic activity occurs

within the neighborhood of the relevant sports venue so that the event, if significant, should affect the MSA/state taxable sales ratio during the time period immediately around the event.

This paper will only consider temporary disruptions in taxable sales, and therefore will only consider mega-events including All-Star games and championships. It will not consider more permanent changes in the local economies such as franchise expansions and contractions, stadium construction, and franchise relocations. In future work, however, it is reasonable that this data could be used for analyzing permanent changes in taxable sales as well.

The Model

In order to examine the impact of the individual sporting events on taxable sales in the relevant MSAs of Florida, we use intervention analysis on an ARIMA model as outlined in Box and Tiao (1975). Others have employed similar techniques to analyze a wide array of economic problems ranging from the impact of the Rodney King riots in 1992 on taxable sales in Los Angeles (Baade and Matheson, 2004c) to the effects of the most recent players' strikes on Major League Baseball attendance (Schmidt and Berri, 2002; Matheson, 2005). Intervention analysis provides a formal test for the change in the mean of a series as a result of an exogenous shock at a specific point in time.

The general intervention ARIMA(P,D,Q) model for the taxable sales ratio is

$$y_t^* = \beta_0 + \sum_{p=1}^{P} \Phi_p \; y_{t-p}^* + \sum_{q=0}^{Q} \Theta_q \; \varepsilon_{t-q} + \sum_{m=1}^{12} \alpha_m \; S_m + \beta_1 z_t$$

where y_t^* is the first-differenced taxable sales ratio in time period t, P is the number of lagged values of y_t^* in the model known as the autoregressive (AR) dimension of the model, ε_t is an error term, Q is the number of lagged values of the error term representing the moving average (MA) dimension of the model, and z_t is an independent variables representing the effect of

various sporting events of other exogenous economic events such as natural or man-made disasters. D is the number of times y_t is differenced to create y_t^*. The model also includes a vector, S_m, of monthly dummy variables to account for seasonal variation in taxable sales.

Augmented Dickey-Fuller tests on the taxable sales ratio for all four MSA time series indicate that the original data series follow non-stationary paths. In all four cases, it is possible to reject the existence of a unit root through first differencing of the original data. Therefore we set D equal to one in all four ARIMA models. Next, the autoregressive and moving average dimensions of the models must be determined through estimation and diagnostic testing using maximum likelihood estimation (MLE). The "optimal" numbers of AR and MA components differ by MSA and are shown in Tables 1-4.

Finally, the vector of independent variables, z_t, must be included. We identify two non-sports occurrences that affected the taxable sales ratio for particular MSAs to provide a better fit for the model. First, Hurricane Andrew in 1992, which devastated the South Florida economy in 1992, had a dramatic effect on taxable sales in the Miami MSA. Taxable sales initially fell in the area in the wake of the storm, then surged as residents rebuilt homes and replaced damaged property, and finally returned to their normal levels after about 18 months. This pattern is modeled using three intervention variables: an initial penalty during the month of the storm (August 1992), a convex "ramp" (above pre-storm levels) that lasted for three months after the storm, and fifteen-month linear decline beginning at the peak of the aforementioned ramp. See Baade, Baumann, and Matheson (2005) for details and a sensitivity analysis of this specification.

Second, the events of 9/11 had a significant impact on the Florida's economy, particularly considering the extent to which Florida relies on tourism. While the level of taxable sales decreases for all of the Florida MSAs in our study, the events of 9/11 only had a significant

impact on the taxable sales ratio in Jacksonville, which experienced a large and permanent (at least through June of 2005) drop in its taxable sales ratio following 9/11. The lack of a 9/11 effect in the Miami, Orlando, and Tampa MSAs is a result of using taxable sales ratios as a method to filter out noise. If taxable sales fell equally in all parts of Florida as a result of 9/11, then taxable sales ratios throughout the state would be unchanged. Thus, the data suggest that 9/11 had a disproportionately heavy impact on the economy of Jacksonville relative to the rest of the state.

The sports variables in z_t include Super Bowls in Tampa in 1984, 1991, and 2001, in Miami in 1989, 1995, and 1999, and in Jacksonville in 2005; the NBA Finals in Orlando in 1995 and the NBA All-Star Game in Orlando in 1992 and in Miami in 1990; the NHL Stanley Cup in Miami in 1996 and in Tampa in 2004 and the NHL All-Star Game in Tampa in 1999 and in Fort Lauderdale (Miami MSA) in 2003; the MLB World Series in Miami in 1997 and 2003; the NCAA Men's Basketball Final Four in Tampa in 1999; and FIFA's World Cup in Orlando in 1994 and the Major League Soccer All-Star Game in 1998.

As the Super Bowl generally occurs in either the last weekend of January or the first weekend of February, the dummy variables for all Super Bowl years include both January and February. This captures spending in preparation for the event, economic activity during the Super Bowl week, and spending occurring several weeks after the big game which should capture some portion of the multiplier effect as local business and residents spend part of their Super Bowl windfall. Similarly, dummy variables for both the NBA and NHL finals cover both May and June since the playoffs and finals can cover portions of both months. All other sports variables cover only the specific month in which the game(s) is played.

If mega-events have a positive impact on a region's economy, then one should expect a consistent pattern of increasing taxable sales ratios during periods with these events. In fact, 12 of the 19 events have a negative coefficient, indicating taxable sales ratio fell below predicted levels during the period in which the event took place. Further, in no case was the change in the taxable sales ratio statistically significant at five percent, and while the 2003 NHL All-Star in Miami is significant at ten percent, this coefficient is negative. On average, the typical mega-event is associated with a 0.185 percent decline in the taxable sales ratio for the corresponding region. For the four MSAs examined, this corresponds to a decrease the area's taxable sales of $34.4 million (in 2004 dollars) per event. Care should be taken in interpreting these figures since the average decline in taxable sales is not statistically different from zero, but the existence of an apparent reduction in taxable sales during mega-events certainly casts doubt on boosters' claims of large windfalls for host cities.

One Final Example

It is worth pointing out one final egregious example of exaggerated booster claims brought about by poor economic reasoning. In 1999 the NFL reported, "Thanks to Super Bowl XXXIII, there was a $670 million increase in taxable sales in South Florida compared to the equivalent January-February period in 1998." (NFL Report, 1999)

Forget for the moment the questionable statistical practice of drawing a conclusion based on a comparison of two years worth of data, and the data do indeed show that the Florida Department of Revenue reported that taxable sales increased by $640 million in the three country region including Broward, Dade, Palm Beach counties in January-February 1999 compared to the same period in 1998. (The $30 million discrepancy between the official figures and the

numbers reported by the NFL is of little significance except to suggest possible sloppiness on the part of the League.)

The important issue here, however, is that taxable sales in the region could be expected to grow for many reasons other than the presence of a mega-event such as inflation, population growth, and increases in real income associated with economic conditions besides the presence of the Super Bowl. Assuming inflation in South Florida matched that of the rest of the United States in between January 1998 and January 1999, inflation should have caused taxable sales to increase by $154 million. Population growth in the area should have added another $187 million in taxable sales while real income growth attributable to favorable economic conditions that existed nationwide in 1998 would be responsible for another $262 million in taxable sales (assuming that taxable sales in South Florida grew as the same pace as nationwide real GDP growth).

Consider Figure 1 for the growth in taxable sales for the three-county area that is identified as South Florida. If after accounting for the impact of inflation, population growth, and real income, all remaining taxable sales increases were attributable to the Super Bowl, then South Florida experienced at most, a $36.9 million impact from Super Bowl XXXIII or roughly 5% of the figures published by the NFL. Of additional interest is that fact that if taxable sales are further broken down by county, both Broward and Palm Beach counties actually experienced lower than expected taxable sales in 1999 (by $14 and $16 million respectively) despite the presence of the Super Bowl. Only Dade County (the actual location of the Super Bowl) experienced an increase in taxable sales (of $67 million) beyond expectations. This is further evidence that mega-events merely tend to shift spending from one area to another rather than generating new economic activity.

As one final note, taxable sales in the area in January-February 2000, the year after the game, were $1.26 billion higher than in the same months during the preceding Super Bowl year in 1999, yet the NFL never publicized a story proclaiming, “Thanks to the lack of a Super Bowl, there was a $1.26 million increase in taxable sales in South Florida compared to the equivalent January- February period in 1999.”

Conclusions

Professional sports leagues, franchises, and civic boosters, have used the promise of an all star game or league championship as an incentive for host cities to construct new stadiums or arenas at considerable public expense. In the past, league and industry-sponsored studies have estimated that Super Bowls, All-Star games and other sports mega-events increase economic activity by hundreds of millions of dollars in host cities. Our analysis fails to support these claims. Our detailed regression analysis of taxable sales in Florida over the period from 1980 to mid-2005 reveals that, on average, mega-events ranging from the World Cup to the World Series have been associated with *reductions* in taxable sales in host regions of $34.4 million per event. While this figure, like any econometric estimate, is subject to some degree of uncertainty, it certainly places on doubt boosters’ claims of huge economic windfalls. Cities would be wise to view with caution economic impact estimates provided by sports boosters, who have a clear incentive to inflate these estimates. It would appear that “padding” is an essential element of many games both on and off the field.

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Table 1: *(Sample 1980.1 - 2005.6) Intervention Analysis*: Miami

Dependent variable: $y_t^* = \Delta$(taxable sales ratio)

Variable	coefficient	std. err.	*t*-statistic	dollar impact
Constant	0.00903**	0.00335	2.70	
Hurricane Andrew – initial penalty	-0.0255**	0.0111	-2.29	
Hurricane Andrew – convex ramp	0.0525**	0.0118	4.44	
Hurricane Andrew – linear decline	0.0664**	0.0110	6.02	$5.126b
Super Bowl 1989	0.00369	0.00743	0.50	$99m
Super Bowl 1995	-0.00139	0.00737	-0.19	-$38.8m
Super Bowl 1999	-0.0110	0.00738	-1.49	-$393.5m
NBA All-Star 1990	-0.00194	0.0101	-0.19	-$21.1m
World Series 1997	-0.000348	0.0100	-0.03	-$4.9m
World Series 2003	0.0104	0.0100	1.03	$193.9m
Stanley Cup 1997	-0.00167	0.00746	-0.22	-$50.3m
NHL All-Star 2003	-0.0181*	0.0101	-1.80	-$278.8m
AR(1)	-0.674**	0.0557	-12.11	
AR(2)	-0.358**	0.0558	-6.42	
MA(12)	0.183**	0.0572	3.20	
log Likelihood	927.863			

Notes: All taxable sales ratios have been first-differenced. All dollar impact values are in 2004 dollars using the CPI. The dollar impact of Hurricane Andrew represents the cumulative effect of the penalty, convex ramp, and linear decline.

The coefficients are reported with their associated t-statistic for the null hypothesis that the estimated value is equal to zero. ** and * represent statistical significance at the one percent and ten percent significance levels respectively.

Table 2: *(Sample 1980.1 - 2005.6) Intervention Analysis*: Tampa

Dependent variable: $y_t^* = \Delta$(taxable sales ratio)

Variable	coefficient	std. err.	*t*-statistic	dollar impact
Constant	-0.00170	0.00105	-1.62	
Super Bowl 1984	-0.00233	0.00225	-1.03	-$51m
Super Bowl 1991	0.00129	0.00382	0.34	$36m
Super Bowl 2001	0.00218	0.00177	1.24	$92.1m
Stanley Cup 2004	0.0003	0.00195	0.15	$13.7m
NHL All-Star 1999	0.00243	0.0134	0.04	$44.8m
NCAA Men's Final Four 1999	-0.00102	0.0496	-0.02	-$20.4m
AR(1)	-0.870**	0.0471	-18.47	
AR(2)	-0.681**	0.0579	-11.76	
AR(3)	-0.489**	0.0706	-6.93	
AR(4)	-0.433**	0.0767	-5.64	
AR(5)	-0.197**	0.0655	-3.00	
log Likelihood	1234.764			

Notes: All taxable sales ratios have been first-differenced. All dollar impact values are in 2004 dollars using the CPI.

The coefficients are reported with their associated t-statistic for the null hypothesis that the estimated value is equal to zero. ** and * represent statistical significance at the one percent and ten percent significance levels respectively.

Table 3: *(Sample 1980.1 - 2005.6) intervention analysis*: Orlando

Dependent variable: $y_t^* = \Delta$(taxable sales ratio)

Variable	coefficient	std. err.	*t*-statistic	dollar impact
Constant	-0.00873**	0.00180	-4.84	
NBA Finals 1995	-0.00226	0.00191	-1.18	-$76.2m
NBA All-Star 1992	-0.00882	0.00889	-0.99	-$117.8m
World Cup 1994	-0.00283	0.00648	-0.44	-$41.8m
MLS All-Star 1998	-0.00441	0.0129	-0.34	-$76.3m
AR(1)	-0.729**	0.0456	-15.97	
AR(2)	-0.611**	0.0694	-8.80	
AR(3)	-0.488**	0.0830	-5.88	
AR(4)	-0.233**	0.0751	-3.11	
AR(5)	-0.196**	0.0537	-3.65	
log Likelihood	1144.588			

Notes: All taxable sales ratios have been first-differenced. All dollar impact values are in 2004 dollars using the CPI.

The coefficients are reported with their associated t-statistic for the null hypothesis that the estimated value is equal to zero. ** and * represent statistical at the one percent and ten percent significance levels respectively.

Table 4 *(Sample 1980.1 - 2005.6) Intervention Analysis*: Jacksonville

Dependent variable: $y_t^* = \Delta$(taxable sales ratio)

Variable	coefficient	std. err.	*t*-statistic	dollar impact
Constant	-0.00115**	0.00114	-1.01	
9/11 Effect	-0.0218**	0.00133	-16.40	$-425.4m
Super Bowl 2005	0.000722	0.00270	0.27	$37.5m
AR(1)	-0.827**	0.0709	-11.66	
AR(2)	-0.710**	0.0919	-7.73	
AR(3)	-0.569**	0.0894	-6.36	
AR(4)	-0.455**	0.0957	-4.75	
AR(5)	-0.352**	0.0838	-4.20	
AR(6)	-0.158**	0.0672	-2.35	
log Likelihood	1357.159			

Notes: All taxable sales ratios have been first-differenced. All dollar impact values are in 2004 dollars using the CPI.

The coefficients are reported with their associated t-statistic for the null hypothesis that the estimated value is equal to zero. ** and * represent statistical significance at the one percent and ten percent significance levels respectively.

Figure 1

South Florida Taxable Sales Increases by Source

Dollar amounts in $millions